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10/728,552	12/04/2003	David Johnston	1020.P17478	8773

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EXAMINER	
JUNTIMA, NITTAYA	
ART UNIT	**PAPER NUMBER**
2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/728,552	JOHNSTON, DAVID	
	Examiner	Art Unit	
	Nittaya Juntima	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed on 8/30/2007.

2. Claims 1-19 are pending.

3. Claims 1-9 and 15-19 are currently rejected under 35 U.S.C. 102(e).

4. Claims 10-14 are currently rejected under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-6, 15-17, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by art of record, Valenci (US 2003/0185220 A1).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 1, Valenci teaches an apparatus (network adapter 80, Fig. 1), comprising:

A configuration module (rules memory 100a, Fig. 3) to store configuration information (action rules). See paragraph 32.

A parsing module (rule-based parser 60b,Fig.3 and action module 160, Fig.3, collectively) to connect to said configuration module, said parsing module to receive a frame of information (a received packet on path 177, Fig. 3/step 195 in Fig 5A) and determine a frame format associated with said frame (identifying packet type in step 201, Fig. 5A), retrieve configuration information corresponding to said frame format and reconfigure a set of hardware elements to parse said frame (parsing actions are retrieved and performed on the received packet based on the packet type by hardware components of the Ethernet device 55,Fig. 2 as shown in steps 205 and 207 in Fig. 5A, see also paragraphs 27, 30, 35-36, 39-40).

Regarding claim 2, Valenci teaches that said parsing module outputs a field type for said frame (packet type of the received packet is identified by the rule-based parser 60b, Fig.3, see step 203 in Fig. 5A and paragraphs 35, 39-40).

Regarding claim 3, Valenci also teaches that said parsing module comprises a table driven non-deterministic push down finite automaton (since a table driven non-deterministic push down finite automaton is not defined, the claim is interpreted as the rule based parser 60b using a parser table/TABLE 1 representing a state machine 180 to classify packet and split data from packet header, paragraphs 33 and 35).

Regarding claim 4, Valenci teaches that said configuration module (rules memory 100a, Fig. 3) comprises:

A state table module to store state information (TABLE 1/parser table contains state information, i.e., S_0, S_1, S_2..., paragraph 33).

A transition table module to store transition information (TABLE 1/parser table contains transition information, i.e., PRE and POST States, paragraphs 33 and 34).

Regarding claim 15, Valenci teaches a method (Fig. 5A) to perform frame parsing, comprising:

Receiving a frame (packet) of information (step 195, paragraph 39).

Determining a frame format (packet type) associated with said frame (step 201, paragraph 39).

Reconfiguring a parsing module (action module 160, Fig.3) to parse said frame of information (action rules control the action module 160 to perform parsing actions on the received packet, Figs. 5A, steps 205,207, see also paragraphs 27, 30, 35-36, 39).

Parsing said frame for frame format information using said reconfigured parsing module (Fig. 5A, steps 205 or 207, e.g., breaking TCP packet into TCP data and TCP header, see also paragraphs 27, 35-39).

Regarding claim 5, Valenci teaches a stack to connect to said parsing module (a software stack must be connected to rule-based parser 60B and action module 160 as a verifier to check whether the parsing was addressed correctly based on these partial rules 170 which are part of

memory 100a in a case of any memory space limitations, see Fig. 3 and paragraph 38), and a mapping module to connect to said parsing module (a mapping module must be connected to map/associate the packet type with the parsed state, paragraph 39 and Fig. 5A, step 203).

Regarding claim 6, Valenci also teaches a delay line module (FIFO) to buffer said frame during said frame parsing (a FIFO used for "on-the-fly" parsing, paragraph 35).

Regarding claim 16, Valenci further teaches wherein said reconfiguring comprises:

Retrieving configuration information (action rules) from a configuration module (action rules memory 175,Fig.3) corresponding to said frame format (paragraphs 30, 32, 36, steps 203-207, Fig. 5A).

Reconfiguring said parsing module using said configuration information (paragraphs 36-36).

Regarding 17, Valenci teaches that said configuration information comprises state information from a state table and transition information from a transition table (action rules use the state machine 180,Fig.4 which is represented by parser table/TABLE 1 containing state information i.e., S_0, S_1, S_2..., and transition information, i.e., PRE and POST States, see claim 8, paragraphs 33-38).

Regarding claim 19, Valenci further teaches delaying said frame until said frame format

information is parsed (the packet is not forwarded to the host system 30a,Fig. 2 until being processed by the action module 10, Fig.3, see the last five lines of paragraph 32).

7. Claims 1-2, 7-9, 15-16, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Sarkinen (US 6,904,057 B2).

Regarding claim 1, as shown in Fig. 3, Sarkinen teaches an apparatus, comprising:

A configuration module (element 320) to store configuration information.

A parsing module (elements 310 and 330 constitute a parsing module) to connect to said configuration module, said parsing module to receive a frame of information (incoming frame 314) and determine a frame format associated with said frame (the preliminary multi-protocol frame classification 312), retrieve configuration information corresponding to said frame format (parsing instructions 322), and reconfigure a set of hardware elements to parse said frame (hardware elements within 410 and 440 in Fig. 4 must be reconfigured in order to provide multi-stage parsing of the incoming frame 314). See col. 10, lines 37-62, col. 11, lines 4-23, col. 12, lines 5-12, 24-col. 13, lines 14, and Fig. 7.

Regarding claim 2, Sarkinen teaches that said parsing module (elements 310 and 330,Fig.3 constitute a parsing module) outputs a field type for said frame (search results 322,Fig.3 represent information about the incoming frame 314, e.g, identification of the fields in the packet/the frame classification, col. 10, lines 49-50, 59-62 and col. 12, lines 61-64).

Regarding claim 7, Sarkinen also teaches that said parsing module (elements 310 and 330,Fig.3 constitute a parsing module) comprises a microcode sequencer (col. 11, lines 14-16).

Regarding claim 8, Sarkinen further teaches that said configuration module (element 320,Fig.3) comprises microcode memory (memory 430, Fig.4) to store mask data (bit mask, col. 11, lines 14-23, 44-59, col. 12, lines 36-38, 48-53), compare data (instructions for relative compare/fixed compare, col. 12, lines 36-38, 48-53), branch addresses (branch instructions, col. 12, lines 36-38, 48-60) and field types (field's predetermined conditions, col. 12, lines 48-60 and col. 13, lines 59-64).

Regarding claim 9, Sarkinen also teaches a delay line module (the dual port memory buffer 416 in Fig. 4) to buffer said frame during said frame parsing (col. 12, lines 24-26, 36-42, 64-col. 13, lines 1-3).

Regarding claim 15, Sarkinen teaches a method (Fig. 3) to perform frame parsing, comprising:

Receiving a frame of information (receiving incoming frame 314, col. 10, lines 39-42).

Determining a frame format associated with said frame (the preliminary multi-protocol frame classification 312 for frame 314 is produced, col. 10, lines 39-42).

Reconfiguring a parsing module to parse said frame of information (parsing instructions 322 are used to control a multi-stage parsing engine 330 for processing frame 314, col. 10, lines 42-48, 59-62, col. 11, lines 14-23).

Parsing said frame for frame format information using said reconfigured parsing module (a multi-stage parsing engine 330 parses frame 314 using parsing instructions 322, col. 10, lines 45-48, 59-62).

Regarding claim 16, Sarkinen further teaches wherein said reconfiguring comprises:

Retrieving configuration information (parsing instructions 322, Fig.3) from a configuration module (a parsing instructions generator 320,Fig.3) corresponding to said frame format (col. 10, lines 42-45, see also step 712 in Fig. 7).

Reconfiguring said parsing module using said configuration information (col. 10, lines 42-47 and 59-62, col. 11, lines 14-23).

Regarding claim 18, Sarkinen further teaches that said configuration information (parsing instructions 322, Fig.3) comprises microcode information (microcode instruction set) from a microcode module (microcode module reads on means that generates microcode instruction set, col. 10, lines 59-62 and col. 11, lines 14-23).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over an art of record, Korpela (EP 0 852 448 A1) in view of Sarkinen (US 6,904,057 B2).

Regarding claim 10, Korpela teaches a system (Fig. 1), comprising:

At least one base station (radio access networks 20a, 20b, 20c, Fig. 1) to communication frames of information using a plurality of different frame formats (col. 4, lines 12-16, col. 8, lines 50-56)

A mobile station (mobile terminal 10, Fig. 1) to receive said frames of information, said mobile station comprising a receiver (RF circuit 12, digital signal processor device 13, and control device 15 constitute a receiver) to receive and process said frames (col. 4, lines 25-40, col. 8, lines 50-56).

However, Korpela does not teach that said receiver is to be reconfigured to dynamically process said frames in accordance with said different frame formats.

In an analogous art of multi-frame-format processing, Sarkinen teaches a network device 100 in Fig. 1 (equivalent to a reconfigurable receiver) that includes Frame/Medium Access Control 112 and a differentiated services routing and policing engine 120 in Fig. 1, collectively, for providing *multi-protocol*, multi-stage, real-time frame classification and generating search results using a preliminary multi-protocol frame classification and parsing instructions generated for incoming frames (equivalent to a reconfigurable receiver that is reconfigured to dynamically process received frames according to different frame formats). See col. 9, lines 58-67-col. 10, lines 3, 19-24, 37-48, 59-col. 11, lines 23.

Since the receiver of Korpela receives different type of frame formats (col. 4, lines 25-30) and given the teaching of Sarkinen on a reconfigurable receiver that dynamically processes different frame formats, it would have been obvious to one skilled in the art at the time of the invention was made to modify the teaching of Korpela to incorporate and apply Sarkinen teaching such that the receiver would be reconfigured to dynamically process said frames according to said different frame formats as claimed. The suggestion/motivation to do so would have been to provide multi-protocol, multi-stage, real-time frame classification and allow fast processing of multiple frame protocols as suggested by Sarkinen (col. 4, lines 4-25).

10. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over an art of record, Korpela (EP 0 852 448 A1) in view of Sarkinen (US 6,904,057 B2), and further in view of Johnson (US 7,184,722 B1).

Regarding claim 11, although Korpela teaches the inherent MAC unit (the media access controller) for processing MAC layer (col. 6, lines 6-12), the combined teaching of Korpela and Sarkinen does not explicitly teach that the receiver comprises a power amplifier, an RF/IF converter to connect to said power amplifier, an IQ module to connect to said RF/RF converter, a baseband processor to connect to said IQ module and the media access controller.

However, Johnson teaches a wireless transmitter such as a mobile unit 18 in Fig. 2 for communicating to a plurality of base stations that includes a receiver (radio 60 working in a receiving direction as shown in Figs. 5A and 5B) comprising a power amplifier (amplifier 75,Fig.5A in the reception portion), an RF/IF converter (RF/IF converter 72,Fig.5A in the

reception portion), an IQ module (I/Q modem 68,Fig. 5B in the reception portion), and a baseband processor (baseband processor PHY 66,Fig.5B in the reception portion) connecting to a MAC (MAC 64,Fig. 5B). See col. 8, lines 7-18, 41-col. 9, lines 1-42.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to further modify the combined teaching of Korpela and Sarkinen such that the power amplifier, RF/IF converter, IQ module, and baseband processor would be connected to the receiver and media access controller as claimed. The suggestion/motivation to do so would have been to enable the received wireless signal carrying data to be processed correctly.

Regarding claim 12, Korpela does not teach that the inherent MAC (see rejection of claim 10) comprises a reconfigurable hardware-based frame parser.

However, in an analogous art, Sarkinen teaches a Frame/Medium Access Control 112 and a differentiated services routing and policing engine 120 in Fig. 1, collectively, that comprises a classifier 300 in Fig. 3 which is a reconfigurable hardware-based frame parser as it provides *multi-protocol*, multi-stage, real-time frame classification and generates search results using a preliminary multi-protocol frame classification and parsing instructions generated for incoming frames (equivalent to a media access controller comprises a reconfigurable hard-ware-based frame parser). See col. 9, lines 58-60, 67-col. 10, lines 3, 27-48. See also col. 9, lines 23-25 and col. 11, lines 14-23.

Given the teaching of Sarkinen, it would have been obvious to one skilled in the art at the time the invention was made to modify the combined teaching of Korpela and Johnson to further include a reconfigurable hardware-based frame parser as claimed. The suggestion/motivation to

do so would have been to provide a parser that is programmable to build search words based on the preliminary multi-protocol frame classification and parsing instructions as suggested by Sarkinen (col. 10, lines 39-48 and col. 11, lines 15-16).

Regarding claim 13, the combined teaching of Korpela and Johnson does not teach that said reconfigurable hardware-based frame parser comprises a configuration module and a parsing module as claimed.

However, Sarkinen teaches that a classifier 300 in Fig. 3 (equivalent to a reconfigurable hardware-based frame parser) that comprises:

A configuration module (element 320) to store configuration information.

A parsing module (elements 310 and 330 constitute a parsing module) to connect to said configuration module, said parsing module to receive a frame of information (incoming frame 314) and determine a frame format associated with said frame (the preliminary multi-protocol frame classification 312), retrieve configuration information corresponding to said frame format (parsing instructions 322), and reconfigure a set of hardware elements to parse said frame (hardware elements must be reconfigured in order to provide multi-stage parsing of the incoming frame 314 is provided). See col. 10, lines 37-62, col. 11, lines 4-23, and step 712, Fig. 7.

Given the teaching of Sarkinen on the configuration module and parsing module, it would have been obvious to one skilled in the art at the time the invention was made to modify the combined teaching of Korpela and Johnson such that the configuration module and parsing module would be included as claimed. The suggestion/motivation to do so would have been to

provide a parser that is programmable to build search words based on the preliminary multi-protocol frame classification and parsing instructions as suggested by Sarkinen (col. 10, lines 39-48 and col. 11, lines 15-16).

Regarding claim 14, neither Korpela nor Johnson teaches a delay line module for buffering said frame during said frame parsing.

However, Sarkinen teaches a dual port memory buffer 416 in Fig. 4 for buffering a frame during frame parsing (equivalent to a delay line module). See col. 12, lines 24-26, 36-42, 64-col. 13, lines 1-3.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the combined teaching of Korpela and Johnson to include a delay line module as claimed. The suggestion/motivation to do so would have been to have the frame written into the buffer and read out from after frame processing is complete as taught by Sarkinen (col. 12, lines 64-col. 13, lines 3 and Fig. 4).

Response to Arguments

11. Applicant's arguments filed 8/30/2007 on pages 8-10 regarding 102 rejection have been fully considered but they are not persuasive.

A. In the remarks regarding claims 1 and 15, Applicant argues that Sarkinen does not teach reconfigure a set of hardware elements to parse said frame because the operations provided by parsing engine are strictly limited to software-based operations.

In response, the Examiner respectfully disagrees. Sarkinen clearly teaches:

- a preprocessor 410 in Fig. 4 that *is programmed* to classify the type of incoming frame (col. 12, lines 5-12);

- the parsing engine 330 as shown in Fig. 3/440 in Fig. 4 is part of *an apparatus* (col. 9, lines 23-25 and col. 10, lines 37-48 and col. 12, lines 5-7, 48-51), *parses the incoming frame* (col. 10, lines 59-62), *is programmable* to build search words and driven by a microcode controlled programmable sequencer implementation (col. 11, lines 14-16), and *executes a new instruction* each clock cycle (col. 13, lines 11-14);

- the process as shown in Fig. 7 implemented as computer program 262 *may be loaded into the classifier 210 in Fig. 2,* which contains elements 310 and 330 of Fig. 3, to cause the classifier 210 to perform the steps as taught by Sarkinen (col. 14, lines 9-19).

Therefore, it is clear that (i) the preliminary multi-protocol frame composition analyzer 310,Fig.3/preprocessor 410,Fig. 4 and (ii) the multi-stage parsing engine 330 in Fig. 3/the parsing engine 440 in Fig. 4 are hardware devices that contain corresponding hardware elements that must be reconfigured by (i) and (ii), respectively, to successfully parse a received frame.

Accordingly, the limitation of "reconfigure a set of hardware elements to parse said frame" is met. The rejection is sustained.

B. In the remarks regarding claims 1-4, 15-17, and 19, Applicant argues that the teaching of claims 1-4, 15-17, and 19 is different than the teaching of Valenci.

In response, since Applicant fails to particularly point out how the teaching of Valenci is different from the teaching of the claims at issue, Examiner respectfully submits that Valenci

teaches all the limitations as recited in the claims (see rejection in section 6 of the Office action). Therefore, the rejection is maintained.

C. Applicant's arguments, see page 10 of the remarks, with respect to the rejection(s) of claim(s) 5-6, 10-14 under 35 U.S.C § 103(a) as being unpatentable over Valenci which is disqualified prior art against the claimed invention have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made. See rejections in section 6 regarding claims 5 and 6, and in sections 9 ad 10 regarding claims 10-14.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 571-272-3120. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nittaya Juntima
January 3, 2008
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